RECTAL ETHER OIL ANAESTHESIA

with Records of 33 Cases in which the Method was personally used.

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C O N T E N T S

RECTAL ETHER OIL ANAESTHESIA.

IN 1913 J. T. Gwathmey of New York, as a substitute for inhalation anaesthesia, introduced the method of inducing and maintaining anaesthesia by the administration, per rectum, of a mixture of ether with oil.

At first carron oil was used, as it was found to part readily with the ether at body temperature. Later, by chance, olive oil was found to be quite as satisfactory, and has since been used.

The early experiments were made on dogs. In the colon the ether separates from the oil, is absorbed as a gas, circulates in the blood, passes through the lungs and thence to the brain. From the lungs a considerable amount of ether vapour is lost by exhalation, unless some form of rebreathing is carried out.

After using this method in 100 cases, ages ranging from 4 to 71 years, Gwathmey claims for it the following advantages: -

1. No expensive apparatus.
2. Very simply technique.
3. Avoidance of apprehension often caused by a face mask, in neurotic subjects.
4. An even plane of light but efficient anaesthesia with, -

a. /

a. Normal pulse.

b. Regular respiration with no stertor and no mucous râles.

c. Corneal reflex constantly present.

d. Complete muscular relaxation.

5. A safe anaesthesia, the safety being due to the slow absorption of ether vapour by the colon the rapid evaporation of it from the lungs.

6. The reduction of after effects to a minimum.

7. The patient's choice of this method after having had experience of both rectal ether oil and inhalation anaesthesia.

Indications for the Use of Rectal Ether Oil.

The use of this method is specially indicated in bronchoscopy, and in operations on head, face, mouth and larynx. This method can be adopted with safety and satisfaction in all cases, with the exception of extensive operations on the rectum. It may be used with advantage in cases of previous severe post anaesthesia nausea and vomiting, and also when a skilled anaesthetist is not available.

Contra indications. -

The general limitations of rectal ether oil are the same as those of inhalation ether. In inflammatory or other diseases of the rectum and lower colon, the method is specially contra-indicated.

GENERAL FACTS.

The preparation of the patient. - The night before the operation, a mild laxative is given, followed in the morning by a soapsuds enema. Three hours before operation, the rectum is irrigated with warm saline. The apparatus used consists of: -

(a) A small rectal tube with funnel attached for the administration of ether oil mixture.

(b) Two rectal tubes (one with funnel attached) for drawing off the excess of ether oil mixture, and irrigating the rectum at the end of the operation.

Preliminary Medication. -

One hour before operation, a hypodermic injection of morphine and atropine is given. In young children this is not always necessary.

Fifteen minutes later, Chloretone gr. v.-xx. in half an ounce of ether oil mixture is run into the rectum.

Administration of the Anaesthetic. -

Half an hour before the operation, the required dose of ether oil is given.

The strength of the mixture is regulated by the age /

age and physique of the patient. The amount given is roughly one ounce of ether oil for every twenty pounds of body weight.

The mixture used for healthy adults is 75 per cent. ether in 25 per cent. olive oil, but to weakly or anaemic patients 65 to 70 per cent. ether in 35 to 30 per cent. olive oil is given.

For children, a mixture of 50 to 65 per cent. ether in 50 to 35 per cent. olive oil is used.

When the patient has been comfortably placed in the Sims position with the sheets suitably arranged, the catheter is introduced for about four inches into the rectum. The ether oil mixture is then run slowly into the rectum through the catheter, at least ten minutes being taken to give the full dose.

The patient must be kept very quiet, and must not be moved for ten to thirty minutes after ether oil has been given or until full anaesthesia is attained.

Ether vapour is given off by the lungs before the administration of ether oil is complete.

The patient first loses sensibility to touch and pain in the lower limbs, surface anaesthesia spreads quickly over the whole body, the patient becomes drowsy, gradually loses consciousness, and is fully anaesthetised /

anaesthetised in from two to thirty minutes after ether oil has been given. The induction period may be shortened by making patient rebreathe into an empty Ormesby or Clover's inhaler, or through a folded towel, or by giving a little chloroform or ether on a mask. The anaesthesia obtained is light, but efficient, and of an even plane; it lasts from one to three hours.

Respiration is quiet and regular, and the pulse remains normal throughout. A clear airway must be constantly maintained. At the end of the operation, a rectal tube is inserted for about four inches into the rectum, and the excess of ether oil drawn off. A second tube (with funnel) is then inserted alongside the first, for about six inches, and the rectum is irrigated with cold soapsuds, one to two pints being used. The outflow tube is then withdrawn, and two to four ounces of olive oil are run into the rectum for retention. Consciousness is regained in from five to thirty minutes after the irrigation of the rectum.

The awakening is gradual, and is seldom accompanied by any discomfort.

Complications. -

1. During anaesthesia stertorous breathing and cyanosis occur if the tongue has been allowed to fall back /

back, or if patient has had an over-dose of ether oil.

A clear airway being assured, normal colour and respiration return on the immediate withdrawal of ether oil ℥ii-iii from the rectum.

2. If the anaesthesia obtained be too light, reinforcement by inhalation is indicated.

Post Anaesthetic Complications. -

Vomiting seldom occurs, and when it does, is so slight as to be practically negligible.

An occasional after result of this method is acute bronchitis coming on a few hours after recovery from the anaesthetic, and lasting one to three days.

Rectal irritation may occur, varying in degree from mild diarrhoea lasting a few hours, to a severe type with or without melaena, lasting several days.

Comparison of other Methods with Rectal Ether Oil.

1. Rectal Ether Vapour Anaesthesia. -

For this method of obtaining anaesthesia, special and prolonged preparation is necessary. For Gwathmey's method, the preparation consists of a mild laxative the night before operation, followed in the morning by a soapsuds enema, and three hours before operation saline irrigation of the rectum.

The /

The apparatus necessary for introducing ether vapour into the rectum is expensive and complicated, and requires special skill and experience in manipulation.

The apparatus used for rectal ether oil anaesthesia is inexpensive and simple, and is easily worked. The administration of rectal ether vapour is continuous throughout the operation. The requisite dose of rectal ether oil is given half an hour before operation, at least ten minutes being taken for the administration. Throughout the operation under rectal ether vapour, the anaesthetist must devote part of his care to the apparatus, but under rectal ether oil, after the required dose has been given, the anaesthetist is free to give his whole attention to the general welfare of his patient.

The complications met with during anaesthesia by rectal ether vapour may be serious and difficult to overcome. The chief danger is sudden paralytic distension of the intestine with rupture of the large gut. Heart failure is another danger.

The most frequent complication encountered with rectal ether oil is a too light anaesthesia requiring some reinforcement by inhalation. Stertorous breathing and approaching cyanosis are the danger signals of overdose during rectal ether oil anaesthesia. When they /

they occur they are easily and quickly remedied by the immediate withdrawal of two or three ounces of ether oil mixture from the rectum.

The type and safety of the anaesthesia obtained by rectal ether vapour depends on the skill and experience of the anaesthetist.

The anaesthesia obtained by rectal ether oil is very satisfactory and safe.

The after results of rectal ether vapour are painful distension of the intestine and severe diarrhoea, with melaena and tenesmus; those of rectal ether oil are acute bronchitis, and diarrhoea (usually mild) with or without melaena.

Rectal ether oil is a safer and more satisfactory method than rectal ether vapour.

2. Inhalation Ether. -

The preparation of the patient for inhalation ether and that for rectal ether oil are the same; except that for the latter irrigation of the rectum is necessary three hours before operation.

Various forms of inhalers requiring more or less skill in manipulation are used for inhalation ether.

The apparatus required for rectal ether oil is simple and easily worked.

During induction by inhalation ether the patient passes /

passes through a period of greater or less degree of excitement, but with rectal ether oil it is unusual for any excitement or struggling to occur. Excessive salivation, deep breathing accompanied by loud moist râles, are the usual accompaniments of inhalation ether, but under rectal ether oil respiration is regular but quiet.

The depth and plane of anaesthesia obtained by inhalation ether depend on the skill and carefulness of the anaesthetist. The anaesthesia obtained by rectal ether oil is light but efficient, and is always of an even plane.

Both methods give a safe anaesthesia. The usual consequents of ether inhalation are post-anaesthetic vomiting, sometimes severe and intractable, and acute bronchitis. A mild type of acute bronchitis is one of the occasional after results of rectal ether oil. Diarrhoea of varying degree may also follow anaesthesia by rectal ether oil.

3. Intra Tracheal Etherisation. -

The preparation of the patient for intra tracheal etherisation is the same as for general anaesthesia. The apparatus is expensive, bulky and complicated, and requires special skill and experience of the anaesthetist.

The /

The apparatus used for administration of rectal ether oil is inexpensive, of little bulk, and is easily worked.

Before the catheter can be passed into the trachea, for intra-tracheal etherisation, anaesthesia must be induced by some inhalation method, and the pharynx must be cocainised. The administration of intra tracheal ether is continuous throughout the operation.

The required dose of rectal ether oil is given half an hour before operation. Reinforcement by inhalation is occasionally necessary to complete induction.

Anaesthesia obtained with intra tracheal ether by a specially skilled anaesthetist is ideal and safe, and lasts during the administration. Rectal ether oil anaesthesia is very satisfactory and safe, and lasts one to three hours. Intra tracheal ether can only be used when an experienced anaesthetist and the necessary apparatus are available.

Rectal ether oil is especially useful when no anaesthetist is available.

Intra tracheal ether when given by a skilled anaesthetist has no after effects. Rectal ether oil is occasionally followed by acute bronchitis and diarrhoea.

4. Transfusion Ether. -

The preparation of the patient for transfusion ether is the same as for general anaesthesia; rectal ether oil requires in addition irrigation of the rectum three hours before operation. The apparatus necessary for transfusion ether is complicated and requires special care and skill in manipulation; that used for rectal ether oil is simply and easily worked. The administration of transfusion ether is continuous throughout the operation, but special skill is necessary with careful and constant attention to the apparatus.

The required dose of rectal ether oil is given half an hour before operation, thereafter the anaesthetist is free to devote his whole attention to the general welfare of the patient. The anaesthesia obtained by transfusion ether depends on the skill and care of the anaesthetist, that obtained by rectal ether oil is always satisfactory.

The chief danger of transfusion ether is sudden cessation of respiration, but deaths have occurred from excessive quantities of saline in the circulation.

During rectal ether oil anaesthesia arrest of respiration may occur, but is easily remedied by withdrawing two or three ounces of the mixture from the rectum.

The possible after results of transfusion ether are air embolism, albuminuria, haemoglobinuria, subcutaneous haemorrhages, excessive vomiting and acute bronchitis.

The possible after results of rectal ether oil are very slight vomiting, acute bronchitis, diarrhoea with or without melaena.

5. Spinal Analgesia. -

No special preparation of the patient is required for spinal analgesia.

Preparation of the patient for rectal ether oil consists of the administration of a mild laxative the night before operation, followed in the morning by a soapsuds enema and irrigation of the rectum.

For spinal analgesia special care is necessary in calculating the dosage, and in the method of administration.

The dosage of ether oil is roughly one ounce for every twenty pounds of body weight. Spinal analgesia is absolute and lasts 1 to 1½ hours.

The anaesthesia obtained by rectal ether oil is very satisfactory and safe.

The dangers of spinal analgesia appearing shortly after administration are, pallor, sickness and dyspnoea.

The /

The only danger during rectal ether oil anaesthesia is a temporary arrest of respiration. The after effects of spinal analgesia include persistent headache, vescical paralysis, loss of rectal control, dyspnoea followed by death.

The after results of rectal ether oil are acute bronchitis of a mild type, and diarrhoea, with or without melaena.

CASE RECORDS.

19 Cases requiring no reinforcement of the anaesthetic and with no complications or after results.

Case III. - E. T., female, weight 6 st. 4 lbs.

Operation for femoral hernia. - 24th January 1914.

Preparation. -

January 22nd, 8 p.m. - Ol Ricini ℥ss.
23rd, 7 a.m. - Simple enema.
24th, 7 a.m. - Simple enema.
9.30 a.m. - Rectal wash out.

Preliminary medication. - January 24th.

10.45 a.m.- Hypodermic injection (Omnopon gr.1/6
(Atropin 1 Sulph. gr. 1/100.

11. a.m.- Chloretone gr. v.)
75 p.c.ether oil ℥ss) per rectum.

Administration /

Administration of Anaesthetic. -

11.10 - 11.20 a.m. - 75% ether oil ℥iii ℔ss per rectum.

Patient was very quiet during induction period, and was fully under the anaesthetic at 11.25 a.m.

Operation for femoral hernia - 11.30 - 11.45 a.m.

On returning to the ward the rectum was washed out with cold soapsuds and olive oil ℥ii given. Patient was conscious at 11.50 a.m.

There was no vomiting, diarrhoea or bronchitis.

Case IV. - M. B., female; age 25 years; weight 7 st. 8 lbs.

Operation for large inguinal hernia. - 24th January.

Preparation. -

January 22nd, 8 p.m. - Ol Ricini ℥ss
23rd, 7 a.m. - Simple enema.
24th, 7 a.m. - Simple enema.
9.45 a.m. - Rectal wash out.

Preliminary medication. - January 24th.

10.55 a.m.- Hypodermic injection (Omnopon gr. 1/6
(Atropin ½ Sulph. gr. 1/100.

11.10 a.m.- Chloretone gr v.
75 p.c. ether oil ℥ss. } per rectum.

Administration /

Administration of Anaesthetic. -

11.25 - 11.35 a.m.- 75% ether oil ℥ v per rectum.

Patient was very quiet during induction period, and was fully under the anaesthetic at 11.45 a.m.

Operation. - For large inguinal hernia.
11.55 a.m. - 12.25 p.m.

On return to the ward rectum was washed out with cold soapsuds, and olive oil ℥ ii given. Patient was conscious at 1.45 p.m. There was no vomiting, diarrhoea or bronchitis.

Case V. - L.H., male; 17 years; weight 5 st.10 lbs.

Operation: Rib resection and drainage for empyema - 26th January.

Preparation: -

January 25th, 8 p.m. - Ol ricini. ℥ss

26th, 7 a.m. - Simple enema.

9 a.m. - Rectal wash-out.

Preliminary medication. - January 26th.

10.45 a.m.- Hypodermic injection (Morph. Sulph. gr. 1/6
(Atropin. Sulph.
(gr. 1/100.
10.55 a.m.- Chloretone gr. v.)
75 p.c. ether oil ℥ss) per rectum.

Administration of Anaesthetic. - 11.10 - 11.20 a.m.
75% ether oil ℥ iiiss per rectum.

Patient was very quiet during induction period, and was fully under the anaesthetic at 11.25 a.m.

Operation. - Rib resection and drainage - 11.30 - 11.50 a.m. On return to the ward, rectum was washed out with coal soapsuds, and olive oil ℥ ii given.

Patient /

Patient was conscious at 12.10 p.m. There was no vomiting, diarrhoea or bronchitis.

Case XVI. - S. M., male; age 23 years; weight 8 st. 8 lbs.

Operation: Opening, scraping and packing chronic axillary abscess. - January 27th.

Preparation. -

January 26th, 8 p.m. - 01 Ricini. ℥ss

27th, 7 a.m. - Simple enema.

9 a.m. - Rectal wash out.

Preliminary medication. - January 27th.

11.20 a.m.- Hypodermic injection (Omnopon gr. 1/3
(Atropin. Sulph. gr. 1/100.

11.30 a.m.- Chloretone grs. v.) per rectum.
75% ether oil ℥ss)

Administration of Anaesthetic. -

11.50 a.m. - noon - 75% ether oil ℥vss per rectum.

Patient was quiet for a few minutes after ether oil had been given; he then struggled actively for about 5 minutes, and gradually quietened down until he was fully under the anaesthetic at 12.15 p.m.

Operation. - 12.15 - 12.30 p.m.

Rectum was washed out with cold soapsuds and olive oil /

oil ℥ ii was given.

Patient was noisy when regaining consciousness; was conscious at 12.50 p.m.

There was no vomiting, diarrhoea, or bronchitis.

Case X. - S. A., male; age 45 years; weight 9 st. 11 lbs.

Operation: Excision right half of soft palate for sarcoma and plastic operation. - February 21st. 1914

Preparation. -

February 19th, 8 p.m. - Ol Ricini ℥vi

20th, 7 a.m. - Simple Enema.

21st, 7 a.m. - Simple Enema.

9 a.m. - Rectal wash-out.

Preliminary medication. - February 20th, 8.30 p.m. - Hypodermic injection of morph. Sulph. gr. 1/6.

February 21st, 11.45 a.m. - Hypodermic injection (Omnopon gr. 1/3
(Atropin Sulph. gr. 1/100
(Hyoscine Hydrobrom gr. 1/100.

11.50 a.m.- Chloretone gr. x.)
)
75% ether oil ℥ss) per rectum.

Administration of Anaesthetic. -

12 - 12.15 p.m. - 75% ether oil ℥vi ss per rectum.

Patient /

Patient was very quiet during induction period, and was fully under the anaesthetic at 12.20 p.m.

Operation. - 12.30 - 1.45 p.m. - On return to the ward, rectum was washed out with cold soapsuds, and olive oil ℥ ii given.

Patient was conscious at 2 p.m.

There was no vomiting, diarrhoea, or bronchitis.

Case XII. - W. S., male; 39 years; weight 9 st. 12 lbs.

Operation: For inguinal hernia, - March 14th. 1914

Preparation. -

March 13th, 8 p.m. - 01 Ricini ℥ vi

14th, 7 a.m. - Simple enema.

9 a.m. - Rectal wash out.

Preliminary medication. - March 14th.

11 a.m. - Hypodermic injection (Omnopon gr. 1/3.
(Atropin Sulph. gr. 1/100
(Hyoscine Hydroprom gr. 1/100.

11.40 a.m.- Chloretone gr. x.)
)
75% Ether oil ℥ ss)per rectum.

Administration of Anaesthetic. -

March 14th, 12.5 - 12.15 p.m., 75% ether oil ℥ vi ss

Patient was quiet during the induction period, and /

and was fully under the anaesthetic at 12.20 p.m.

Operation. - 12.30 - 12.50 p.m.

On return to the ward, rectum was washed out with cold soapsuds, and olive oil ℥ii given.

Patient was conscious at 1.10 p.m.

There was no vomiting, diarrhoea or bronchitis.

Case XIV. - J. S., male; 36 years; weight 10 st. 12 lbs.

Operation: For inguinal hernia April 2nd 1914

Preparation. - April 1st, 8 p.m. 01 Ricini ℥vi

2nd, 7 a.m. Simple enema.

9 a.m. Rectal wash-out.

Preliminary medication. - April 2nd.

2.40 p.m.- Hypodermic injection (Omnopon gr. 1/3
(Atropin Sulph. gr. 1/100.
(Hyoscine Hydroprom gr. 1/100.

2.50 p.m.- Chloretone gr. v.)
)
75% ether oil ℥ss) per rectum.

Administration of Anaesthetic. -

3.20 - 3.30 p.m. - 75% ether oil

There was some struggling after ether oil had been given, but patient was fully under the anaesthetic at 3.45 p.m.

Operation. - 3.50 p.m. - 4.10 p.m.

Rectum /

Rectum was washed out with cold soapsuds, and olive oil ℥ii given.

Patient was conscious at 4.30 p.m. There was no vomiting, diarrhoea, or bronchitis.

Case XVIII. - G. G., male; age 43 years; weight 9 st. 9 lbs.

Operation: For double varicocele, - April 29th.

Preparation. -

April 27th, 8 p.m. - Ol Ricini ℥ss

28th, 7 a.m. - Simple enema.

10 a.m. - Rectal wash out.

Preliminary medication. - April 29th.

3.30 p.m. - Hypodermic injection (omnopon gr. 1/3
(Atropin Sulph.
(gr. 1/100

3.45 p.m. - Chloretone gr. x.)
)
75% ether oil ℥ss) per rectum.

Administration of Anaesthetic. -

4.15 - 4.25 p.m. - 75% ether oil ℥vi ℥ii

Patient was quiet during induction period, and was fully under the anaesthetic at 4.30 p.m.

Operation. - 4.50 - 5.15 p.m.

Rectum was washed out with cold soapsuds, and olive oil ℥ii given.

Patient was conscious at 5.25 p.m. There was no /

no vomiting or diarrhoea, but on the second day after operation patient had a slight cough.

Case XX. - M. B., female; 52 years; weight 15 stones, but taken as 10 st. 10 lbs.

Operation. - Cholecystotomy, - May 5th. 1914

Preparation. -

May 4th, 8 p.m. - Ol Ricini 3 vi

5th, 7 a.m. - Simple enema.

9 a.m. - Rectal wash out.

Preliminary medication: - May 5th.

2.45 p.m. - Hypodermic injection (Omnopon gr. 1/6
(Atropin Sulph.
(gr. 1/100.

3 p.m. - Chloretone gr. v.)
)
75% ether oil 3ss) per rectum.

Administration of anaesthetic. -

3.10 - 3.20 p.m. - 75% ether oil 3 vii

Patient was quiet during induction period, and was fully under the anaesthetic at 3.23 p.m.

Operation. - Cholecystotomy - 3.45 - 4.15 p.m.

Rectum was washed out with cold soapsuds, and olive oil 3 ii given.

Patient was conscious at 4.20 p.m. She vomited once as she was regaining consciousness. There was no diarrhoea or bronchitis.

Case XXI. /

Case XXI. - G. D., female; 34 years; weight 10 st. 8 lbs.

Operation. - Ligature of haemorrhoids and extraction 7 careous teeth. - May 6th.

Preparation. -

May 5th, 8 p.m. - Ol Ricini ℥ss

6th, 7 a.m. - Simple enema.

9 a.m. - Rectal wash-out.

Preliminary medication. - May 6th.

2.40 p.m. - Hypodermic injection (Ommopon gr. 1/3.
(Atropin Sulph.
(gr. 1/100.

3 p.m. - Chloretone gr. x.)
)
75% ether oil ℥ss) per rectum.

Administration of Anaesthetic. -

3.20 - 3.30 p.m. - 75% ether oil ℥ vi ss

Patient was quiet during induction period, and was fully under the anaesthetic at 3.35.

Operation. - 3.40 - 4 p.m.

When sphincter ani was being stretched, about two drachms of ether oil mixture escaped.

After the operation, rectum was washed out and olive oil ℥ i/ii given.

Patient was conscious at 4.15 p.m. There was no vomiting or diarrhoea, but patient had a slight cough on second day after operation.

Case XXIII. /

Case XXIII. - C. R., male; 38 years; weight 9 st. 3 lbs.

Operation: For Inguinal hernia.- May 14th.

Preparation. -

May 13th, 8 p.m. - Ol Ricini ℥vi

14th, 7 a.m. - Simple enema.

9 a.m. - Rectal wash-out.

Preliminary medication: - May 14th.

2.20 p.m. - Hypodermic injection (Omnopon gr. 1/3.
(Atropin Sulph.
(gr. 1/100.

2.45 p.m. - Chloretone gr. v.)
)
75% ether oil ℥ ss) per rectum.

Administration of Anaesthetic. -

3 - 3.10 p.m. - 75% ether oil ℥ vi

Patient was quiet during the induction period, and was fully under the anaesthetic at 3.20 p.m.

Operation. - 3.55 - 4.15 p.m.

Rectum was washed out with cold soapsuds, and olive oil ℥ ii given.

Patient was conscious at 4.20 p.m. There was no vomiting, diarrhoea or bronchitis.

Case XXIV. - H. B., male; 21 years; weight 7 st. 12 lbs.

Operation: Appendicectomy. - May 14th.

Preparation. /

Preparation. -

May 12th, 8 p.m. - 01 Ricini ℥ss

13th, 7 a.m. - Simple enema.

14th, 7 a.m. - Simple enema.

9 a.m. - Rectal wash-out.

Preliminary medication. - May 14th.

2.50 p.m. - Hypodermic injection (morph. Sulph. gr. 1/6.
(Atropin Sulph.
(gr. 1/100.

3.45 p.m. - Chloretone gr. V.)
)
75% ether oil ℥ss) per rectum.

Administration of Anaesthetic. -

4 p.m. - 4.10 p.m. - 75% ether oil ℥v

Patient was quiet during induction period, and was fully under the anaesthetic at 4.15 p.m.

Operation. - Appendicectomy. - 4.20 - 4.50 p.m.

Rectum was washed out with cold soapsuds, and olive oil ℥ii given.

Patient was conscious at 5 p.m. There was no vomiting, diarrhoea or bronchitis.

Case XXV. - E. H., female; 19 years; weight 9 st. 12 lbs.

Operation: Excision tuberculous focus in left forearm. - May 18th.

Preparation. -

17th May, 4 p.m. - 01 Ricini ℥ss
18th May, 5.30 a.m. - Simple enema.
7 a.m. - Rectal wash-out.

Preliminary medication. - May 18th.

9 a.m. - Hypodermic injection (Morph. Sulph. gr. 1/6
(Atropin Sulph.
(gr. 1/100.

9.55 a.m.- Chloretone gr. V.)
)
75% ether oil ℥ss) per rectum.

Administration of Anaesthetic. -

10.5 - 10.15 a.m. - 75% ether oil

Patient was quiet during induction period, and was fully under the anaesthetic at 10.20 a.m.

Operation. - 10.30 - 10.55.

Rectum was washed out with cold soapsuds, and olive oil ℥iv given.

Patient was conscious at 11.10 a.m. There was no vomiting, diarrhoea or bronchitis.

Case XXVII. - B. L., male; 35 years; weight 9 st.

Operation: i. Appendicectomy

ii. Exploratory incision through upper left rectus, examination liver, gall, bladder, stomach and intestines. - May 19th.

Preparation. -

May 18th, 8 p.m. - Ol Ricini ℥vi

19th, 7 a.m. - Simple enema.

10 a.m. - Rectal wash-out.

Preliminary medication. - May 19th.

2.40 /

2.40 p.m. - Hypodermic injection (Omnopon gr. 1/3
(Atropin Sulph.
(gr. 1/100.

2.55 p.m. - Chloretone gr. v.)
)
75% ether oil 3ss) per rectum.

Administration of Anaesthetic. -

3.10 - 3.25 p.m. - 75% ether oil 3vi

Patient was quiet during induction period, and was fully under the anaesthetic at 3.30 p.m.

Operation. - 3.45 - 4.45 p.m.

Rectum was washed-out with cold soapsuds, and 3ii olive oil given.

Patient was conscious at 4.50 p.m.

There was no vomiting, diarrhoea or bronchitis.

Case XXVIII. - S. H., female; 7 years; weight 2 st. 11 lbs.

Operation: - Rib re-section and draining for empyema. - May 20th.

Preparation. -

19th May, 8 p.m. - Ol Ricini 3ii

20th May, 7 a.m. - Simple enema.

9 a.m. - Rectal wash-out.

Preliminary medication. - May 20th.

11 a.m. - Hypodermic injection (Omnopen gr. 1/9.
(Atropin Sulph.
(gr. 1/300.

11.15 a.m.- Chloretone gr. v.)
60% ether oil 3ss) per rectum.

Administration /

Administration of Anaesthetic. -

11.30 - 11.35 a.m. - 60% ether oil ℥ss

Patient struggled actively after ether oil had been given, but was under the anaesthetic at 11.38 a.m.

Operation. - 11.40 a.m. - 12.5 p.m.

Rectum was washed out with cold soapsuds, and olive oil ℥ij given.

Patient was conscious at 12.15 p.m. There was no vomiting, diarrhoea or bronchitis.

Case XXIX. - E. F., female; 23 years; weight 7 st. 1 lb.

Operation: - Curetting. - May 28th.

Preparation.

May 27th, 8 p.m. - Ol Ricini ℥ss

28th, 7 a.m. - Simple enema.

9 a.m. - Rectal wash-out.

Preliminary medication. - May 28th.

10.30 a.m. - Hypodermic injection (Morph. Sulph. gr. 1/6. Atropin Sulph. gr. 1/100.

10.45 a.m. - Chloretone gr. v.)
75% ether oil ℥ss) per rectum.

Administration of Anaesthetic. -

11 - 11.10 a.m. - 75% ether oil ℥ vss

Patient /

Patient was quiet during induction period, and was fully under the anaesthetic at 11.20 a.m.

Operation. - 11.30 - noon.

Rectum was washed out with cold soapsuds, and olive oil 3 ii given.

Patient was conscious at 12.15 p.m. There was no vomiting, diarrhoea or bronchitis.

Case XXXI. - H. McD., 19 years; male; 8 st. 10 lbs.

Operation: - Re-section three ribs and drainage of subphrenic abscess. - May 29th.

Preparation. -

May 28th, 8 p.m. - Ol Ricini 3ss

29th, 7 a.m. - Simple enema.

9 a.m. - Rectal wash-out.

Preliminary medication. - May 29th.

2.30 p.m. - Hypodermic injection (morph. Sulph. gr. ¼
(Atropin Sulph.
(gr. 1/100.

2.40 p.m. - Chloretone gr. v.)
)
75% ether oil 3 ss) per rectum.

※

Patient was quiet during the induction period, and was fully under the anaesthetic at 3.17 p.m.

Operation. - 4.15 - 5.15 p.m.

Rectum was washed out with cold soapsuds, and olive oil 3 ii given.

Patient /

※ Administration of Anaesthetic 3.5 - 3.15 p.m. 75% ether oil 3 vss

Patient was conscious at 5.20 p.m. - There was no vomiting, diarrhoea or bronchitis.

Case XXXII. - A. A., female; 25 years; weight 6 st. 7 lbs.

Operation: Intra Peritoneal shortening of round ligaments. - June 2nd. 1914

Preparation. -

June 1st, 8 p.m. - Ol Ricini ℥ss

2nd, 7 a.m. - Simple enema.

9 a.m. - Rectal wash-out.

Preliminary medication. - June 2nd.

2.30 p.m. - Hypodermic injection (Morph. Sulph. gr. 1/6. (Atropin Sulph. gr. 1/100.

2.40 p.m. - Chloretone gr. v.) 75% ether oil ℥ss) per rectum.

Administration of Anaesthetic. -

3 p.m. - 3.10 p.m. - 75% ether oil ℥iv

Patient was quiet during induction period, and was fully under the anaesthetic at 3.20 p.m.

Operation. - 3.30 - 4.15 p.m.

Rectum was washed out with cold soapsuds, and olive oil ℥ij given.

Patient was conscious at 4.25 p.m. There was no vomiting, diarrhoea or bronchitis.

Case XXXIII. -

E. M., female; 23 years; weight 6 st.8 lbs.

Operation: - Curetting. - June 2nd.

Preparation. -

June 1st, 8 p.m. - Ol Ricini ℥ss

2nd, 7 a.m. - Simple enema.

9 a.m. - Rectal wash-out.

Preliminary medication. - June 2nd.

2.50 p.m. - Hypodermic injection (Morph. Sulph. gr. 1/6.
(Atropin Sulph. gr. 1/100.

3.10 p.m. - Chloretone gr. v.)
)
75% ether oil ℥ss) per rectum.

Administration of the Anaesthetic. -

3.30 - 3.40 p.m. - 75% ether oil ℥ iv

Patient was quiet during induction period, and was fully under the anaesthetic at 3.43 p.m.

Operation. - 4.25 - 4.45 p.m.

Rectum was washed out with cold soapsuds, and olive oil ℥ii given.

Patient was conscious at 4.55 p.m.

There was no vomiting, diarrhoea or bronchitis.

Five cases requiring no reinforcement of the anaesthetic /

anaesthetic, but having complications or after results. -

Case II. -

G.A., female; 27 years; weight 10 stones?

Operation: - Shaving head, cleansing and dressing extensive scalds (~~by honey~~) of head, face, neck, forearms and hands. January 18th 1914

Preparation. -

January 18th, 7 a.m. - Simple enema.

9 a.m. - Rectal wash-out.

Preliminary medication. - January 18th.

10.30 a.m. - Hypodermic injection (Omnopon gr. 2/9
(Atropin. Sulph.
(gr. 1/100.

10.45 a.m. - Chloretone gr. v.)
)
75% ether oil ℥ss) per rectum.

Administration of Anaesthetic. -

11.20 - 11.30 a.m. - 75% ether oil ℥vi/ss per rectum.

Patient was quiet during the induction period, and was under the anaesthetic at 11.40 a.m.

Operation. - 11.40 a.m. - 12.40 p.m.

When head was being shaved, patient suddenly stopped breathing, and became very cyanosed. The tongue was drawn forward and artificial respiration performed, but the cyanosis deepened.

Ether oil/

Ether oil ℥ ii were drawn off from the rectum, breathing began immediately, and colour became normal.

When dressing was completed, the rectum was washed out with cold soapsuds, and olive oil ℥ ii given.

Patient was conscious at 2.30 p,m. She vomited once.

There was no diarrhoea or bronchitis.

Case XV. -

F. J., male; 17 years; 6 st. 7 lbs.

Operation: - Appendicectomy. - April 2nd. 1914

Preparation. -

March 31st, 8 p.m. - Ol Ricini ℥ss

April 1st, 7 a.m. - Simple enema.

2nd, 7 a.m. - Simple enema.

9 a.m. - Rectal wash-out.

Preliminary medication. - April 2nd.

3 p.m. - Hypodermic injection (Morph. Sulph. gr. 1/6. (Atropin. Sulph. gr. 1/100.

3.30 p.m. - Chloretone gr. v.) 75% ether oil ℥ss) per rectum.

Administration of the Anaesthetic. -

3.50 - 4 p.m. - 75% ether oil ℥ iv per rectum.

Patient /

Patient was quiet during induction period, and was fully under the anaesthetic at 4.3 p.m.

Operation. - 4.15-4.45 p.m.

Rectum was washed out with cold soapsuds, and olive oil ℥ij given.

The rectal wash-out contained fresh blood.

Patient was conscious at 5 p.m. There was no vomiting or diarrhoea.

Patient had an attack of acute bronchitis, lasting two days.

Case XVI. - E.B., male; 28 years; weight 11 st.12 lbs.

Operation: For small inguinal hernia. -

April 29th.

Preparation. -

April 27th, 8 p.m. - Ol Ricini ℥vi

28th, 7 a.m. and 9 a.m. - Simple enema.

29th, 7 a.m. - Simple enema.

9 a.m. - Rectal wash-out.

Preliminary medication. - April 29th.

2.40 p.m. - Hypodermic injection (Omnopon gr. 1/3
(Atropin. Sulph.
(gr. 1/100.

2.45 p.m. - Chloretone gr. v.)
)
75% ether oil ℥ss) per rectum.

Administration of Anaesthetic. -

3. - 3.15 p.m. - 75% ether oil. ℥viii

Patient /

Patient struggled very actively after either oil had been given. He was fully under the anaesthetic at 3.40 p.m.

Operation. - 3.40 - 4.5. p.m.

Rectum was washed out with cold soapsuds, and olive oil 3 ℔ given.

Patient was conscious at 4.30 p.m.

There was no vomiting, but about 10 p.m., April 29th, severe diarrhoea commenced and lasted 24 hours.

There was no bronchitis.

Case XVII. -

A.J.M., male; 22 years; weight 10 st.

Operation: For large scrotal hernia. -

April 29th.

Preparation. -

April 27th, 8 p.m. - Ol Ricini

28th, 7 a.m. - Simple enema.

29th, 7 a.m. - Simple enema.

9 a.m. - Rectal wash-out.

Preliminary medication. - April 29th.

2.40 p.m. - Hypodermic injection (Omnopon gr. 1/3
(Atropin. Sulph.
(gr. 1/100.

3 p.m. - Chloretone gr. v.)
)
75% ether oil 3ss) per rectum.

Administration /

Administration of the Anaesthetic. -

3.30 p.m. - 3.40 p.m. - 75% ether oil ℥vi/ss

Patient was quiet during the induction period, and was under the anaesthetic at 3.42 p.m.

Operation. - 4.10 - 4.40 p.m.

Rectum was washed out with cold soapsuds, and olive oil ℥ii given.

Patient was conscious at 5 p.m.

There was no vomiting or diarrhoea, but patient had a mild attack of acute bronchitis lasting two days.

Case XXX. -

R. S., male; 44 years; 9 st. 4 lbs.

Operation: - Excision of torn internal semi-lunar cartilage. - May 29th.

Preparation. -

May 27th, 8 p.m. - Ol Ricini ℥ss

28th, 7 a.m. - Simple enema.

29th, 7 a.m. - Simple enema.

9 a.m. - Rectal wash-out.

Preliminary medication. - May 29th.

2.30 p.m. - Hypodermic injection (Morph. Sulph. gr. 1/4. (Atropin. Sulph. gr. 1/100.

2.40 p.m. - Chloretone grs. V.) 75% ether oil ℥ss) per rectum.

Administration /

Administration of the Anaesthetic. -

2.50 - 3 p.m. - 75% ether oil ℥vi

Patient struggled actively, and was very noisy for a few minutes after ether oil had been given, and was not fully under the anaesthetic till 3.30 p.m.

Operation. - 3.45 - 4.10 p.m.

Rectum was washed out with cold soapsuds and 2 ozs. olive oil given.

Half-an-hour later diarrhoea with melaena set in, and lasted for two days.

There was no vomiting or bronchitis.

Patient was conscious at 4.40 p.m.

Five cases requiring reinforcement of the anaesthetic by inhalation. -

Case I. -

E.C., female; 15 years; weight 5 st.8 lbs.

Operation: - Hemithyroidectomy. January 13th 1914

Preparation. -

6th-13th January - Simple enema daily at 7 a.m.

13th " 10 a.m. - Rectal wash-out.

Preliminary medication. - January 13th.

3.45 p.m. - Hypodermic injection (omnopon gr. 1/6
(Atropin. Sulph.
(gr. 1/100.

4 p.m. - Chloretone gr. v.)
)
Olive oil ℥ss) per rectum.

Administration of the Anaesthetic. -

4.10 - 4.25 - 65% ether oil ℥iv

Patient was quiet during induction period, but as she was merely drowsy at 4.30, open ether was given to complete induction.

Towards the end of the operation, a little open ether was given at intervals.

Shortly after administration, about 1 oz. ether oil was returned.

Operation. - 4.35 p.m. - 5.35 p.m.

Rectum was washed out with cold soapsuds, and olive oil ℥iv given.

Patient was conscious at 5.40 p.m.

There was no vomiting, diarrhoea or bronchitis.

Case VII. -

H. S., male; 18 years; 8 st. 7 lbs.

Operation: Excision torn left internal semilunar cartilage. - January 28th.

Preparation. -

January 27th, 8 p.m. - Ol Ricini ℥ss

28th, 7 a.m. - Simple enema.

9 a.m. - Rectal wash out.

Preliminary medicatiom. - January 28th.

2.30 p.m. - Hypodermic injection (Omnopon gr. 2/9
(Atropin. Sulph.
(gr. 1/100.

2.45 p.m. - Chloretone gr. v.)
75% ether oil ℥ss) per rectum.

Administration of Anaesthetic. -

3.5 - 3.15 p.m. - 75% ether oil ℥vij

Patient was quiet during induction period, and appeared to be fully under anaesthetic at 3.30, when a sudden very loud noise partially roused him; about two ounces of ether oil were returned almost immediately.

Patient was then made to rebreathe into an empty Ormesby inhaler for a few seconds. No further reinforcement was necessary until the skin sutures were being inserted, when a little open ether was given.

Operation. - 3.40 - 4.10 p.m.

Rectum was washed out with cold soapsuds, and olive oil ℥ij given. Patient was conscious at 4.15 p.m. He vomited once. There was no diarrhoea or bronchitis.

Case IX. -

W.B., male; 23 years; weight 10 st. 6 lbs.

Operation: - Excision torn internal semilunar cartilage. - February 14th. 1914

Preparation. -

February 13th, 8 p.m. - Ol Ricini ℥vi

14th, 7 a.m. - Simple enema.

9 a.m. - Rectal wash-out.

Preliminary /

Preliminary medication. - February 14th.

11.15 a.m. - Hypodermic injection (Omnopon gr. 1/3.
(Atropin Sulph.
(gr. 1/100.

11.30 a.m. - Chloretone gr. x.)
)
75% ether oil ℥ss) per rectum.

Administration of Anaesthetic. -

11.45 - 11.55 - 75% ether oil

Patient was quiet during the induction period, but was not fully under the anaesthetic at 12.5 p.m. A little nitrous oxide gas was given to complete induction. No further reinforcement was necessary.

Operation. - 12.10 - 12.30 p.m.

Rectum was washed out with cold soapsuds, and olive oil ℥ii given.

Patient was conscious at 12.45 p.m. There was no vomiting, diarrhoes, or bronchitis.

Case XI. -

J. H., female; 47 years; 8 st. 2 lbs.

Operation: Wertheim's Panhysterectomy. -

March 11th. 1914

Preparation. -

March 9th, 8 p.m. - Ol Ricini ℥j

10th, 7 a.m. - Simple enema.

11th, 7 a.m. - Simple enema.

9 a.m. - Rectal wash-out.

Preliminary /

Preliminary medication. - March 11th.

9.15 a.m. - Hypodermic injection (Omnopon gr. 2/9.
(Atropin. Sulph.
(gr. 1/100.

10.15 a.m. - Chloretone gr. v.)
)
75% ether oil 3ss) per rectum.

Administration of anaesthetic. -

10.40 - 10.50 a.m. - Ether oil 75% 3v

Patient was quiet during the induction period, and was fully under the anaesthetic at 11 a.m.

Operation. - 11.5 a.m. - 1.35 p.m.

At the end of 1½ hours the abdominal muscles became strongly contracted, but there were no other signs of lessening of anaesthesia. Chloroform was given at intervals during the last hour of the operation, through a Junker inhaler held some inches from the patient's face. Five drachms of chloroform were used. Oxygen was given continuously during the operation.

At the end of the operation, the rectum was washed out with cold coapsuds, and olive oil 3 ii given.

Patient was conscious at 2 p.m.

There were no after results.

Case /

Case XXII. -

T. A., male; 7 years; 7 st. 12 lbs.

Operation: - Amputation of finger at metacarpo-phalangeal joint after crush. - May 13th. 1914

Preparation. -

May 12th, 6 p.m. - Ol Ricini ℥ss

13th, 7 a.m. - Simple enema.

9 a.m. - Rectal wash-out.

Preliminary medication. - May 13th.

11 a.m. - Hypodermic injection (Omnopon gr. 1/3
(Atropin. Sulph.
(gr. 1/100.

11.25 a.m. - Chloretone gr. v.)
)
75% ether oil ℥ss) per rectum.

Administration of anaesthetic. -

11.35 - 11.45. a.m. - 75% ether oil ℥v

per rectum.

Patient struggled actively after ether oil had been given, and was still struggling at 11.55. Induction was completed with open ether. No further reinforcement was necessary.

Operation. - 12 - 12.10 p.m.

Rectum was washed out with cold soapsuds, and olive oil ℥ii given.

Patient was conscious at 12.30 p.m. There was no vomiting, diarrhoea or bronchitis.

Three cases requiring reinforcement of the anaesthetic and having after results. -

Case VIII. -

E. T., female; 56 years; weight 8 st.10 lbs.

Operation: Radical for Scirrhus Manmae. -

January 28th. 1914

Patient had double aortic disease amd suffered from chronic bronchitis.

Preparation. -

January 26th, - Ol Ricini ℥ss

27th, 7 a.m. - Simple enema.

28th, 7 a.m. - Simple enema.

9 a.m. - Rectal wash-out.

Preliminary medication. - January 28th.

2.45 p.m. - Hypodermic injection (Omnopon gr. 1/6.
(Atropin. Sulph.
(gr. 1/100.

3.30 p.m. - Chloretone gr. v.)
)
75% ether oil ℥ss) per rectum.

Administration of Anaesthetic. -

4.10 - 4.20 p.m. - 75% ether oil ℥vss

After ether oil had been given, patient became very noisy and struggled actively. She was still struggling at 4.35 p.m. C.E. was given to complete induction. Patient was fully under the anaesthetic at 4.36. No further reinforcement was necessary.

Operation /

Operation. - 4.40 - 6 p.m.

Rectum was washed out, and olive oil 3ij given. Patient was conscious at 6 p.m.

January 29th. - Patient developed acute bronchitis. There was failure of compensation ~~and~~ for heart lesions, and patient died January 30th.

Case XIII. -

J.C., male; 32 years; weight 10 st.10 lbs.

Operation: Amputation great toe for gangrene after crush. - March 16th. 1914

Preparation. -

March 15th, 8 p.m. - Ol Ricini 3vi

16th, 7 a.m. - Simple enema.

9 a.m. - Rectal wash-out.

Preliminary medication. - March 16th.

11.30 a.m. - Hypodermic injection (Omnopon gr. 1/3
(Atropin. Sulph.
(gr. 1/100.

11.45 a.m. - Chloretone gr. v.)
)
75% ether oil 3ss) per rectum.

Administration of Anaesthetic. -

12. - 12.10 p.m. - 75% ether oil 3 vii

Patient struggled actively after ether oil had been given; was quiet but not anaesthetised at 12.20 p.m. Induction was completed with open ether; no further reinforcement was necessary.

Operation /

Operation. - 12.25 - 12.40 p.m.

Rectum was washed out with cold soapsuds, and olive oil 3ii given.

Patient was conscious at 12.50 p.m. There was no vomiting or bronchitis.

Patient had mild diarrhoea for 1 day.

Case XIX. -

G. R., male; 54 years; 11 st. 5 lbs.

Operation: -

1. For inguinal hernia (left)) April
2, Excision lipoma in right loin) 29th. 1914

Preparation. -

April 27th, 8 p.m. - Ol Ricini 3vi

28th, 7 a.m. - Simple enema.

29th, 7 a.m. - Simple enema.

9 a.m. - Rectal wash-out.

Preliminary medication. - April 29th.

3.55 p.m. - Hypodermic injection (Omnopon gr. 1/3.
(Atropin. Sulph.
(gr. 1/100.

2.30 p.m. - Chloretone gr. v.)
)
75% ether oil 3ss) per rectum.

Administration of Anaesthetic. -

5 - 5.10 p.m. - 75% ether oil. 3 viiss

After ether oil had been given, patient was very noisy /

noisy and struggled actively. At 5.15 p.m. two ounces of ether oil were suddenly returned.

5.25 p.m., 75% ether oil ℥ij given. Patient was fully under the anaesthetic at 5.30 p.m.

Operation. - 5.30 p.m. - 6 p.m. A little open ether was given towards the end of operation. Rectum was washed out with cold soapsuds, and olive oil ℥ij given.

Patient was conscious at 6.15 p.m. There was no diarrhoea or vomiting, but patient had an acute attack of bronchitis lasting two days.

One case on which rectal ether oil had no anaesthetic effect. -

Case XXVI. -

W.A., male; 50 years; 10 st. 12 lbs.

Operation: - Amputation of great toe for gangrene after crush. - April 18th.

Preparation: -

April 17th, 7 p.m. - 01 Ricini ℥ij

18th, 7 a.m. - Simple enema.

9 a.m. - Rectal wash-out.

Preliminary medication. -

17th /

17th April, 6 p.m.- Hypodermic injection (Morph. Sulph. gr. 1/6.

18th April, 11 a.m.- Hypodermic injection (Omnopon. gr. 1/3. Atropin. Sulph. gr. 1/100.

11.15 a.m. - Chloreton gr. v.)
75% ether oil 3ℓ) per rectum.

Administration of anaesthetic. -

11.25 - 11.35 a.m. - 75% ether oil 3 viii

Patient was very quiet, but ether oil had no effect on him.

12.35 - Chloroform was given on a mask.

Operation. - 12.40 - 12.55 p.m.

Rectum was washed out with cold soapsuds, and olive oil 3 ii given.

There was no vomiting, diarrhoea or bronchitis.

SUMMARY /

SUMMARY OF CASES

SUMMARY OF CASES.

Preparation of the patient. When possible a laxative was given on the second night before operation and followed in the morning by a soapsuds enema.

On the morning of operation a soapsuds enema was given about 7 a.m. and two hours later the colon was irrigated with warm saline.

Preliminary medication.

One hour before operation a hypodermic injection of morphine and atropine was given to each patient, and fifteen minutes later Chloretone grs. V. - X. in half an ounce of ether oil mixture was run into the rectum.

Administration of the Anaesthetic.

Half an hour before operation the requisite dose of rectal ether oil was given per rectum, not less than ten minutes being taken to give the full amount. One patient (Case I.) was given 65% ether in 35 per cent. olive oil, and one Case XXVIII. aged 7 years was given 60 per cent. ether in 40 per cent. olive oil.

The other patients, ages 17 years to 58 years, were all given 75% ether in 25 per cent. olive oil.

The /

The amount given to each patient was roughly one ounce of the mixture for every twenty pounds of body weight. Case XI was given two drachms, Case V four drachms and Case I and Case XXVI were given one ounce more than the full dose of ether oil mixture. Case I was given an extra ounce on account of the weak mixture (65 p.c. ether oil).

Case XXVI was given one ounce more than was indicated by his weight, on account of previous difficulty experienced in inducing anaesthesia by chloroform inhalation.

The shortest time taken for anaesthesia to come on was two minutes and the longest was thirty minutes, after ether oil mixture had been given.

One case XXVI was still quite unaffected by rectal ether oil at the end of an hour after administration.

Sixteen cases were anaesthetised in two to five minutes after ether oil had been given. None of these were given any adjuvant to complete induction.

Ten cases were fully under the anaesthetic in ten minutes; of these four were given some form of inhalation anaesthetic to complete induction.

Two cases took fifteen minutes to go under the anaesthetic, none of them required reinforcement to complete induction.

One case VIII took 16 minutes to go under, and was

given /

given C_1E_2 to complete induction.

One case (XVI) took twenty five minutes to become anaesthetised, but was given no reinforcement.

Another patient Case XXX was only fully under the anaesthetic at the end of half an hour, but was given no adjuvant to complete induction.

One patient Case XXVI a very strong alcoholic miner (weight 10 st. 12 lbs.) was given 8½ ounces of 75 per cent ether oil, but was scarcely drowsy at the end of an hour after administration of ether oil.

Chloroform was necessary to induce and maintain anaesthesia.

Excitement with struggling, which was easily controlled, occurred a few seconds after the administration of ether oil, in nine of the thirty two cases anaesthetised. The other twenty three cases were quiet during the induction period.

Reinforcement to complete induction.

Four cases were given some form of inhalation anaesthetic to complete induction.

Of these one (Case I) was given a little open ether at intervals during the operation.

(Hemithyroidectomy)

One patient Case VII was partially roused and alarmed by a sudden very loud noise, he returned about two ounces ether oil. An empty Ormesby inhaler was applied /

applied to his face, and he was quiet in a few seconds. When the skin wound was being sutured, a little open ether was given to reinforce rectal ether.

Reinforcement during the operation was necessary in four cases.

Case I was given a little open ether at intervals during the operation.

Cases VII & XIX were given a little open ether immediately before skin sutures were inserted.

Case XI was given chloroform (through a Junker inhaler held some inches from the face) at intervals during the last hour of the operation. (Wertheims Panhysterectomy) This patient had continuous oxygen administration throughout the operation.

The anaesthesia obtained in twenty six of the thirty two cases anaesthetised was ideal and was satisfactory in the other five.

Complications.

1. During adminstration of ether oil.

Occasionally there was some difficulty in maintaining a steady flow of ether oil through the catheter.

2. After administration but before anaesthesia was complete.

Active struggling occurred in seven cases and slight restlessness in two cases. The struggling ceased /

ceased as the anaesthetic took effect.

The other 23 cases went under the anaesthetic very quietly.

3. <u>During the operation</u>.

1. Arrest of respiration occurred in one Case (II)

2. Reinforcement of the anaesthetic was necessary in four cases.

Case II (severe honey scald of face, head, neck, hands, and forearms) was not weighed before operation but said her weight was 10 stones. She was given seven ounces of 75 per centether oil and took ten minutes to become anaesthetised. A few minutes later while head was being shaved breathing became stertorous and then stopped. Patient was deeply cyanosed. There had been no obstruction of the airway, but the tongue was drawn forward, and artificial respiration performed. Cyanosis deepened. Two or three ounces of ether oil mixture was drawn off from the rectum, and immediately colour improved and respiration was restored.

Cases I, VII, XI, XIX required reinforcement of the anaesthetic during operation.

<u>After results.</u>

<u>Vomiting</u>.

Very slight vomiting occurred in two cases II & VII.

<u>Diarrhoea</u> /

Diarrhoea. Two patients (Cases IX & XIII) had slight diarrhoea lasting one day.

About 7 hours after operation one patient Case XVI contracted a very severe attack of diarrhoea without melaena. With treatment the diarrhoea stopped within 24 hours of onset. This patient was subject to attacks of obstinate constipation lasting 7 - 14 days and followed by severe diarrhoea lasting 2 - 10 days.

Case XXX. Half an hour after operation severe diarrhoea with melaena set in. The attack lasted two days. This patient suffered from recurrent attacks of severe diarrhoea, but he had never had melaena.

In one case (XV) the rectal wash out (at the end of the operation) contained fresh blood, but no diarrhoea or melaena followed. This patient had an attack of acute bronchitis with raised temperature, which lasted for two days.

Bronchitis occurred in 6 cases.

Case XXI had a slight cough for one day.

Cases XV, XVII, XVIII, XIX, had acute bronchitis with raised temperature for 2 days. Case VIII a worn out alcoholic charwoman aged 56 years, with double aortic disease, who suffered from chronic bronchitis /

bronchitis with occasional very severe attacks of acute bronchitis, developed acute bronchitis a few hours after radical operation for scirrhus manmae lasting 1 hour 20 minutes, and died within 48 hours as a result of failure of compensation for heart lesions.

Five cases had previously been given inhalation anaesthetics. Four of these had suffered from severe post anaesthetic vomiting.

Case IV had been given gas and ether for curetting 18 months, and closed ether 12 months before having rectal ether oil. Both times patient had severe post anaesthetic vomiting. Rectal ether oil was given for operation for large inguinal hernia. Patient vomited once only, on regaining consciousness.

Case V. Three weeks before rectal ether oil was given this patient had C_1E_2 for rib resection and drainage for empyema. Nausea and vomiting persisted for 24 hours. No nausea or vomiting occurred after admininstration of rectal ether oil for rib resection and drainage for empyema. Case XIII open ether and C_1E_2 was given to this patient for examination of injured foot a week before operation under rectal ether oil. Slight post anaesthetic vomiting occurred but /

but was not severe. Following rectal ether oil there was no vomiting but mild attack of diarrhoea.
Case XXVI was given C_1E_2 and chloroform a week before rectal ether oil, he was very difficult to anaesthetise. He had no post anaesthetic vomiting. Rectal ether oil had no anaesthetic effect on him and chloroform had to be given to induce and maintain anaesthesia.

Case XXXI had had inhalation ether twice, vomiting occurred after each anaesthetic, before rectal ether was given. No vomiting or other after results followed the administration of ether oil.
One case (II) who had not been anaesthetised before, was given rectal ether oil for first dressing of severe honey scald of face, etc., she vomited once on regaining consciousness.

~~When~~ Ether, C_1E_2 or chloroform was given each day for a week for dressings, mild anaesthetic vomiting occurring every time.

T A B L E O F C A S E S

RECORDED BY WRITER.

Name & Age	Weight	Ether Oil Amount and Strength	Anaesthesia			Operation	Remarks
			Induction	Duration	Recovery		
1.E.C.15 yrs. F.	5 st. 8 lbs.	6~~5~~% 4½oz.	10 min.	1 hr. 5 m.	5 min.	Hemithyroidectomy 1 hour	Open ether was given to complete induction, and repeated at intervals during the operation.
2.G.A.27 yrs. F.	10 st. ?	75% 7 oz.	10 min.	2 hrs.50 m.	1 hr.50 m.	Cleansing and dressing extensive honey scald 1 hour	Sudden arrest of respirations, ether oil withdrawn from rectum. Vomited once after regaining consciousness.
3.E.T.36 yrs. F.	6 st. 4 lbs.	75% 4 oz.	5 min.	25 min.	5 min.	Femoral hernia 15 minutes	Anaesthesia ideal.
4.M.B.25 yrs. F.	7 st.11 lbs.	75% 5½oz.	10 min.	2 hours	1 hr.15 m.	Inguinal hernia 30 minutes	Anaesthesia ideal.
5.L.H.17 yrs. M.	5 st.10 lbs.	75% 4 oz.	5 min.	45 min.	20 min.	Resection rib drainage for empyema 20 minutes	Anaesthesia ideal.
6.S.M.23 yrs. M.	8 st. 8 lbs.	75% 6 oz.	15 min.	35 min.	20 min.	Opening scraping chronic axillary abscess 15 minutes	Anaesthesia ideal.
7.H.S.18 yrs. M.	8 st. 7 lbs.	75% 6 oz.	15 min.	40 min.	5 min.	Excision torn semilunar cartilage - 30 minutes	Partially roused by sudden loud noise, ether oil returned. Rebreathing into empty Ornisby inhaler for a few seconds. A little open ether was given when skin sutures being inserted.

Name & Age	Weight	Ether Oil Amount and Strength	Anaesthesia			Operation	Remarks
			Induction	Duration	Recovery		
8.E.T.56 yrs. F.	8 st.10 lbs.	75% 6 oz.	16 min.	1 hr. 24 m.	10 min.	Radical opn. mammary scirrhus 1 hr. 20 min.	C_1E_2 was given to complete induction. Anaesthesia perfect. Death occurred 48 hrs. afterwards from acute bronchitis, etc.
9.W.B.23 yrs. M.	10 st. 6 lbs.	75% 7½oz.	10 min.	40 minutes	15 min.	Excision torn semilunar cartilage - 20 min.	Nitrous oxide gas was given to complete induction. Anaesthesia ideal. Thereafter mild diarrhoea for 1 day.
10.S.A.45 yrs. M.	9 st.11 lbs.	75% 7 oz.	5 min.	1 hr. 40 m.	15 min.	Excision right half soft palate for sarcoma and plaster operation 1¼ hours.	Anaesthesia perfect.
11.J.H.47 yrs. F.	8 st. 2 lbs.	75% 5½oz.	10 min.	3 hours	25 min.	Wertheim's hysterectomy - 2½ hrs.	Chloroform through Junker inhaler at intervals during the last hour of operation. Continuous oxygen inhalation was given throughout.
12.W.G.39 yrs. M.	9 st.12 lbs.	75% 7 oz.	5 min.	50 min.	20 min.	Inguinal hernia - 20 min.	Anaesthesia perfect.
13.J.C.32 yrs. M.	10 st.10 lbs.	75% 7½oz.	10 min.	30 min.	10 min.	Amputation of toe after crush. 15 min.	Induction completed with open ether. Very mild diarrhoea 1 day. Anaesthesia ideal.
14.J.S.36 yrs. M.	10 st.12 lbs.	75% 7½oz.	15 min.	45 min.	20 min.	Inguinal hernia. 30 minutes.	Anaesthesia ideal.

Name & Age	Weight	Ether Oil Amount and Stregnth	Anaesthesia			Operation	Remarks
			Induction	Duration	Recovery		
15. F.J. 17 yrs. M.	6 st. 4 lbs.	75% 4½oz.	3 min.	57 min.	15 min.	Appendicectomy 30 minutes	Anaesthesia ideal. Acute bronchitis lasting 2 days.
16. E.B. 28 yrs. M.	11 st. 12 lbs.	75% 8¼oz.	25 min.	1 hr. 20 m.	25 min.	Inguinal hernia 25 minutes.	Severe diarrhoea lasting 24 hrs. Anaesthesia ideal.
17. A.J.M. 22 M.	10 st.	75% 7 oz.	2 min.	1 hr. 18 m.	20 min.	Scrotal hernia. 30 minutes.	Acute bronchitis lasting 3 days. Anaesthesia ideal.
18. G.G. 43 yrs. M.	9 st. 9 lbs.	75% 6¾oz.	5 min.	55 min.	10 min.	Double varicocele. 25 minutes.	Mild attack of bronchitis 3 days. Anaesthesia ideal.
19. G.R. 54 yrs. M.	11 st. 5 lbs.	75% 8 oz.	5 min.	45 min.	15 min.	I. Inguinal hernia II. Excision lipoma in loin. 30 min.	A little open ether given towards the end of the operation. Acute bronchitis 2 days.
20. M.B. 58 yrs. F.	15 st. taken as 10 st. 10 lbs.	75% 7½oz.	3 min.	57 min.	5 min.	Cholecystotomy. 30 minutes.	Anaesthesia ideal.
21. E.D. 34 yrs. F.	10 st. 8 lbs.	75% 7 oz.	5 min.	40 min.	15 min.	Ligature haemorrhoids-20 min.	Slight cough lasting 1 day. Anaesthesia perfect.
22. T.A. 27 yrs. M.	7 st. 12 lbs.	75% 5½oz.	10 min.	35 min.	20 min.	Amputation finger after crush. 15 minutes.	Open ether given to complete induction. Thereafter anaesthesia ideal.
23. G.R. 38 yrs. M.	9 st. 3 lbs.	75% 6½oz.	10 min.	1 hour	5 min.	Inguinal hernia 20 minutes.	Anaesthesia ideal.
24. H.B. 21 yrs. M.	7 st. 12 lbs.	75% 5½oz.	5 min.	45 min.	10 min.	Appendicectomy 30 minutes.	Anaesthesia ideal.
25. E.H. 25 yrs. F.	9 st. 12 lbs.	75% 6½oz.	5 min.	50 min.	15 min.	Excision tubercular focus in forearm - 25 m.	Anaesthesia ideal.

Name & Age	Weight	Ether Oil Amount and Strength	Anaesthesia: Induction	Anaesthesia: Duration	Anaesthesia: Recovery	Operation	Remarks
26. W.A. 50 yrs. M.	10 st. 12 lbs.	75% 8½oz.	-	-	-	Amputation toe.	Chloroform was necessary to induce and maintain anaesthesia.
27. B.L. 35 yrs.	9 st.	75% 6½oz.	5 min.	1 hr. 20 m.	10 min.	I. Appendicectomy II. Exploration of abdomen through second incision. 1 hour.	Anaesthesia perfect.
28. S.H. 7 yrs. F.	2 st. 11 lbs.	60% 2 oz.	3 min.	37 min.	10 min.	Resection rib and drainage for empyema - 25 min.	Anaesthesia perfect.
29. E.F. 23 yrs. F.	7 st.	75% 5 oz.	10 min.	55 min.	20 min.	Curetting - 30 minutes.	Anaesthesia perfect.
30. R.S. 44 yrs. M.	9 st. 4 lbs.	75% 6½oz.	30 min.	55 min.	30 min.	Excision torn semilunar cartilage - 25 min.	Anaesthesia perfect. Diarrhoea and melaena lasting two days.
31. H. McD. M. 19 yrs.	8 st. 12 lbs.	75% 6 oz.	2 min.	2 hrs. 7 m.	10 min.	Resection portions of two ribs, - drainage for subphrenic abscess. 1 hour.	Anaesthesia ideal.
32. A.A. 25 yrs. F.	6 st. 7 lbs.	75% 4½oz.	10 min.	1 hr. 50 m.	10 min.	Intraperitoneal shortening of round ligaments - 45 minutes.	Anaesthesia ideal.
33. E.M. 23 yrs. F.	6 st. 8 lbs.	75% 4½oz.	3 min.	1 hr. 10 m.	10 min.	Curetting. 20 minutes	Anaesthesia ideal.

COMMENTARY

COMMENTARY.

J. T. Gwathmey of New York after employing rectal ether oil in 200 cases considers his method safe and very satisfactory.

The Anaesthesia obtained is light but efficient pulse and respiration are normal, there is complete muscular relaxation, and the after effects are reduced to a minimum. The apparatus is inexpensive and of little bulk and the technique is simple.

The only danger during anaesthesia is arrest of respiration; it is a rare occurrence, and ample warning is given of its approach by the onset of stertorous breathing with cyanosis and loss of lid reflex. The remedy is immediately to draw off two or three ounces of the ether oil mixture from the rectum. If the anaesthesia prove too light some inhalation anaesthetic may be given to reinforce the ether oil. This method has been employed with good results and Gwathmey's conclusions have been confirmed by C. G. Heyd of New York in thirty cases and by Julien Pate of Valdosta in three cases.

I have employed the method in 33 cases and have found it safe and satisfactory in 32 . On one case rectal ether oil had no anaesthetic effect. The only /

only difficulty met with during administration was the occasional arrest of flow of ether oil, this was easily remedied by altering the position of the catheter in the rectum.

After ether oil had been given, some excitement with struggling, which was easily controlled, occurred in 9 cases.

One patient, who was moved before the anaesthetic had taken full effect, returned about 2 ounces ether oil mixture. Shortly afterwards two ounces ether oil were given per rectum, and were retained.

Another patient was partially roused by a sudden very loud noise, and returned one or two ounces of ether oil. He was made to rebreathe into an empty Ormesby inhaler and was soon under the anaesthetic again. A little open ether was given to this patent when skin sutures were being inserted.

In five cases recourse was had to inhalation methods to complete induction as it was inconvenient to wait for full anaesthesia to come on with ether oil alone.

In 26 of the thirty two cases anaesthetised the anaesthesia was ideal, requiring no reinforcement and having pulse and respiration normal, brisk corneal reflex and muscles well relaxed.

In one case only was there any respiratory trouble /

trouble, and this was quickly overcome. In five cases inhalation methods were resorted to, near the end of the operation. Of the after results acute bronchitis occurred most frequently, but in all cases was of a mild type lasting 1-2 days.

One patient, who developed acute bronchitis, ~~and~~ died within 48 hours as the result of double aortic disease. During the operation this patient gave no cause for anxiety, respiration being normal and pulse good.

There were four cases of diarrhoea following the use of rectal ether oil. Two of these were mild and two severe.

In one severe case, diarrhoea was unaccompanied by melaena and responded quickly to treatment, in the other case diarrhoea with melaena persisted for two days.

The chief disadvantage of this method in my opinion is the length of time which must elapse between the preliminary dose of chloretone and the oncoming of full anaesthesia.

That rectal ether oil may fail to produce anaesthesia in certain people as in Case xxvi is another disadvantage.

The chief advantage of the method is the even plane /

plane of light but efficient anaesthesia having pulse and respiration normal, and brisk corneal reflex present with complete muscular relaxation.

The absolute freedom of the anaesthetist to devote his whole care to the general welfare of the patient during the operation is another advantage.

The gradual and quiet loss of consciousness and the peaceful awakening with no unpleasant accompaniments are also advantages. Another advantage is the simplicity of the technique.

The safety of the method makes it a very useful one to employ when no skilled anaesthetist is available. Some theoretical objections to the method have been advanced by H. Clifton Luke and R.C. Coburn of New York.

One disadvantage according to Luke is the rather exhaustive and unpleasant experience accompanying any special rectal preparation as required by this method.

In his earlier cases, Gwathmey considered it essential that the preparation should be the same as for rectal ether vapour anaesthesia. Later his patients were prepared as for general anaesthesia with the addition of irrigation of the rectum three hours before operation.

Luke states that preliminary and subsequent proctoscopic /

proctoscopic examinations are necessary to insure safety, this is not so, if the previous history of the patient be taken into account. Rectal ether oil should not be given to any patient who is subject to recurrent attacks of diarrhoea or intestinal catarrh.

Another disadvantage according to Luke is the occurrence during the induction period of cramps with distressing sensations of fullness and pressure in the lower bowel. These do not occur if care be taken that the patient is comfortably placed in the Sim's position before the administration is begun and that the ether oil mixture is run slowly and evenly into the rectum, at least ten minutes being taken to give the full dose.

Luke also brings forward the objection that varying degrees of anal irritation may occur early or late in the induction period, with return of part or whole of ether oil given.

This happens only if the mixture has been injected too quickly, if the patient is moved before full anaesthesia has come on, or if he is partially roused and alarmed when almost under the anaesthetic. Another disadvantage according to Luke is the occurrence of mild to very severe proctitis and colitis as after results of this method.

Diarrhoea /

Diarrhoea of varying degree is one of the occasional after results quoted by Gwathmey. Severe diarrhoea does not occur if care be taken that the method is not adopted for patients who suffer from recurrent attacks of intestinal catarrh.

Delayed recovery which may be prolonged many hours is another of Luke's objections.

The usual time taken to recover from rectal ether oil, after post operative irrigation of the rectum is five to twenty minutes. In thirty two cases anaesthetised the shortest time taken to recover was five minutes and the longest time one hour fifty minutes. Usual recovery time was ten to twenty minutes.

Another of Luke's objections is, that the induction period may be prolonged, and that it may be frequently necessary to have recourse to inhalation methods.

In the thirty two cases anaesthetised the induction period of rectal ether oil alone varied from 2 minutes to half an hour; in five cases it was found inconvenient to wait for full anaesthesia from ether oil to come on, and some form of inhalation anaesthetic was given to complete induction.

The induction period of ether oil with inhalation anaesthetic in four cases lasted ten minutes and in one sixteen minutes. Only one of these (induction period /

period 10 minutes) required reinforcement of the anaesthetic during the operation.

Luke says that at any time after the first fifteen minutes respiratory depression may suddenly or slowly appear followed by arrested breathing, loss of muscular tone and dilated pupils with the possibility of fatal syncope supervening.

Gwathmey considers his method safe, and states that if stertor or cyanosis occur several ounces of the mixture must be immediately withdrawn from the rectum and there will be no further danger. It is essential that a clear airway be constantly maintained.

Arrest of respiration with deep cyanosis occurred in one of my cases. Normal breathing and good colour were quickly restored on drawing off two ounces of ether oil from the rectum. Thereafter the anaesthesia was satisfactory and the patient gave no further cause for anxiety.

Coburn considers, that with this method, there is a larger amount of ether in the circulation than is compatible with safety of the patient, and that there is a greater tendency towards respiratory paralysis without the corresponding depth of anaesthesia obtained by other methods. He therefore concludes that the margin of safety between surgical anaesthesia and /

and respiratory paralysis is considerably reduced in this method.

Gwathmey and Heyd have found the method a safe one with regular respiration and normal pulse.

In thirty one cases anaesthetised by me, there was no cause for anxiety during the anaesthesia which was always of an even plane with normal respiration and good pulse. In the other case an overdose had been given, which resulted in temporary respiratory arrest quickly remedied by drawing off two ounces ether oil from the rectum.

A P P E N D I X

SUMMARY OF PREVIOUS LITERATURE ON THE SUBJECT.

OIL-ETHER ANESTHESIA.

AN ATTEMPT TO ABOLISH INHALATION ANESTHESIA

BY

JAMES T. GWATHMEY M.D.*

The author refers to 24 experiments on dogs. In the first 2 experiments a 5% ether solution in normal saline was used: in the other experiment oil-ether was used. Ether is miscible in all proportions in oil. The oil also prevents irritation and its great affinity for ether prevents a too rapid absorption of the latter; furthermore when the oil-ether mixture is in the colon, as the ether leaves the oil in gaseous form, heat is extracted from surrounding parts, including the oil-ether mixture and the colon. This cooling checks both evaporation and absorption and regulates the doses at all times. The difference between the slow absorption from the colon and the rapid elimination from the lungs is the third factor that assists in automatically regulating the anesthesia.

Experiments were then made to discover if there was any difference in time in the ether separating from /

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* "New York Med. Jour." 1914. XCIX. 211 - 214. Read at the XVIIth Inter: Medical Congress, London, Aug. 6 - 12th 1913.

from the oils. The oils used were codliver, neatsfoot, paraffin oil, carron oil, and Russian mineral oil; also milk and cream. The same quantity of ether and of the oils was placed in separate test tubes and put in a water bath kept at a temperature of approximately body heat. The carron oil parted with the ether in nearly $\frac{1}{4}$ of the time of the other oils.

In 1 experiment in which 100 c.c. of ether in 250 c.c. of olive oil (40%) was injected into a dog of 10 kg. the animal became completely narcotized in one hour, when the whole solution had been injected. The anesthesia persisted with a good pulse and regular, deep breathing for 45 minutes, when the breathing became short and irregular. The respiration gradually became weaker and stopped 15 minutes later, death resulting; no effort being made to save the animal. This dog had received a large amount of morphine preliminary to taking the ether.

In 2 other experiments in which no morphine was given, 1 dog (weight six kg.) received 150 c.c. of a 40% ether solution and 1 (weight 6 kg.) 190 c.c. of 40% solution. In neither was complete anesthesia obtained. In the remaining experiments, the ether was given in solution in oil from 55 - 75% the amount of ether injected being from 50 - 75 c.c. 10 successful /

ful experiments were carried out with complete anesthesia and no alarming symptoms.

The shortest time required for surgical anesthesia was 5 minutes, the longest 50. The duration of anesthesia after the ether injection was stopped averaged about an hour, except in cases in which the colon was washed out, when recovery set in more promptly. Never any evidence of more than a mild irritation of the rectum followed the ether injection, and this passed off within 24 hours. A flushing of the colon with a large amount of fluid has shortened the duration of anesthesia and the subsequent injection of oil prevented or lessened rectal irritation.

One of the advantages of oil-ether anesthesia is that it avoids certain dangers incidental to intravenous anesthesia; a second is, tnat the only apparatus needed is a small cathether and a funnel into which to pour the mixture; a third is, that it may be administered, if necessary, without the slightest exposure of the patient, the tube being introduced between 2 suitably adjusted sheets, the patient lying comfortably on the left side.

On account of the gradual and equal absorption of the ether from the colon and also on account of its evaporation from the lungs, it appears to be at least /

least a comparatively safe anesthesia.

It is important that the preparation of the patient should be the same as for ether-vapor anesthesia by rectum.

The preliminary medication, the percentage and amount of the mixture (roughly, one ounce to every 20 lb. of body weight) varies with the age, size and general condition of the patient. A 50-65% solution is sufficient for children and weak anemic adults, while a 75% solution is usual with normal adults and should never be exceeded.

The patient should be kept perfectly quiet and about 20 minutes should be allowed for the anesthetic to take effect before the patient is moved. 8 oz. of the 75% mixture will last from $2\frac{1}{2}$ - 3 hours. If the operation is completed before this time 2 small rectal tubes are inserted and as much of the mixture is drawn off as possible. Cold water soapsuds are now injected into one tube and drawn off through the other and one rectal tube is then withdrawn. 2 - 4 oz. of olive oil is now introduced into the rectum, followed by 1 pint to 1 quart of water and the second tube is withdrawn. The patient recovers consciousness in 15 - 30 minutes after this procedure.

The ether is obliged to pass through the lungs before reaching the brain. Consequently a loss is sustained unless a small bag for rebreathing is placed /

placed over the face - a large sterile paper bag held in place by a rubber band answers all purposes.

From 200 - 300 c.c. of a mixture of three parts of ether to one part of oil seems to be about the right amount. Of some 200 successful cases in which this method has been employed, in half of this number a supplementary inhalation anesthetic was used, the oil-ether anesthesia proving too light in these particular instances.

The resulting anesthesia is ideal - pulse and respiration normal, no mucous râles, and no after-effects, as regards either nausea or diarrhœa.

The method, if proved practical, is capable of development in three ways:

1. As a distinct method.
2. In connection with some inhalation anesthetic, as gas and oxygen, or ether or chloroform.
3. In connection with novocaine or some other local anesthetic, increasing materially the field of local anesthesia.

OIL-ETHER ANAESTHESIA.

BY

J. T. GWATHMEY.*

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Regarding the former use of carron oil for oil-anaesthesia, the author states that it was used because it parted with ether in solution readily, but an error of a hospital pharmacist in compounding it with olive instead of linseed oil, thereby preventing proper mixing of the lime water, prompted the use of simple olive oil, which has continued, and he therefore uses 75% of ether with 25% of olive oil.

The advantages claimed for the method are: (1) avoidance of apprehension caused by a face mask; (2) no expensive apparatus; (3) after-effects reduced to minimum; (4) complete relaxation (he claims "more than in any other known method"); (5) the limits of safety are widened, compared with other methods; (6) a more even plane of anaesthesia than by inhalation methods, unless in the hands of a skilled anaesthetist with perfected apparatus. These conclusions were /

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* "New York Medical Journal" 1913. XCVIII 1101.

were based on about 100 cases in which this method was used, the ages ranging from 4 - 71 years, some with careful blood and urine and blood pressure observations. The patients' choice of this method, after having had experience with other methods, is cited in argument.

9 illustrative cases are cited. All but one - a girl of 9 years - received preliminary medication, usually morphine and atrophine hypodermatically and chloretone by rectum. In some a portion of the mixture had to be withdrawn for signs of over dose, cyanosis, stertor, or respiratory arrest. This suggests a peculiarity of oil-ether rectal anaesthesia, that respiration should be smooth and easy, without stertor, and with reflexes, especially lid-reflex, present. No deaths were properly charged to the anaesthetic, though one ensued within 24 hours from extensive organic disease. Care and good judgment must be exercised in the doses of preliminary medication and in the strength of the ether solution.

Physiological action is based upon the separation of the ether from the oil after its introduction, its absorption as a gas, circulation in the blood, passing through the lungs, where part is lost by exhalation, thence reaching the brain. The first symptom /

symptom experienced by the patient is a loss of sensation in the lower extremities. Correspondingly, the return of sensation and pain follows that of consciousness. It is argued that wide latitude of safety is proved by the recovery of one case of respiratory arrest for 8 minutes; that it may be possible, by injecting a weak solution, to use this method for relief of pain, in place of morphine. Yet action depends on the circulation of the ether through the brain; moreover, a preliminary hypodermatics explain analgesia.

The indications for the use of the method are, especially, bronchoscopy, Grave's disease, other conditions of fear or need of "anoci-association," operations on or about the head, cases of previous nausea and vomiting. The contra-indications are the same as for ether, also colon and rectal inflammations.

When a surgeon must work alone, or depend on a layman for help, instead of using the full strength it is best to substitute a weaker solution and add a supplementary anaesthetic by inhalation to avoid the possible need of withdrawing any.

The dose suggested for guidance is: For children under 6 years, a solution of 50%; 6 - 12 years, 55 - 65% - these without preliminary medication; 12 - 15 years, the same, with perhaps addition of morphine

1/12 gr. and atropine 1/200; from 15 years upward 75% with preliminary medication according to the individual case 30 minutes before operation, and with, usually, chloretone 5 gr. in ether 2 dr. mixed with olive oil 2 dr. by rectum. The preparation of the patient includes irrigation of the colon, but not purging, and rest in bed for 2 hours. The technique is introduction of the oil-ether solution by funnel and catheter to 3 - 4 inches within the rectum, the patient in the Sims position, taking at least five minutes for 8 ounces. After the operation, a pair of small rectal tubes are introduced and the colon irrigated with cold soap-suds, then about 2 - 4 oz. of olive oil, only, introduced for retention.

RECTAL ANAESTHESIA: TECHNIQUE FOR THE INDUCTION OF OIL-ETHER (COLONIC) ANAESTHESIA.

BY

C. G. HEYD.*

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Heyd reports 30 cases of colonic oil-ether anaesthesia from the New York Post Graduate Hospital. The technique now used is as follows:-

The preparation consists of a mild laxative the night before operation, but no purging; soapsuds enema in the morning; and saline irrigation of the colon 3 hours before operation.

The contra-indications are the same as for ether, though bronchitis, asthma, and illness from former ether by inhalation are not a hindrance. Diseases of the lower bowel; considerable distress by the patient on the introduction of the solution are contra-indications.

The apparatus consists of a small catheter and funnel for the oil-ether solution and two small tubes for withdrawing any of the solution from the rectum.

One hour before operation, there is administered per /

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* Post - Graduate 1914. XXIX. 120.

per rectum, chloretone, gr. XX, ether and oil-ether, of each drams 2 - 4; one half hour before operation and injection of morphine gr. 1/3 - 1/4, atrophine gr. 1/200 - 1/100 is given, hypodermatically. The mixture consists of olive oil 2 ounces, ether 6 oz. or, for weak, anaemic adults, ether 55 - 65%; oil 45 - 35%; for children, ether, 50% in oil. With the patient in the Sims position, the catheter is inserted 4 inches and the solution injected, taking at least 5 minutes. The quantity used is 1 oz. to each 20 lb. of the body weight. There should be a delay of 10 - 30 minutes before moving the patient.

The danger signals are loss of lid reflex; stertor, or embarrassed respiration; approaching cyanosis. When any of these are present, 2 - 3 oz. of the solution should be withdrawn from the rectum.

The post-operative treatment consists of immediate irrigation of the rectum with cold soap-suds, then, withdrawing one tube 2 - 4 oz. of olive oil and a pint to a quart of cold water should be injected and the remaining tube withdrawn.

ETHER-OIL-RECTAL ANAESTHESIA;
SOME THEORETICAL CONSIDERATIONS.

BY

H. CLIFTON LUKE, M.D.*

ANESTHETIST TO ST. LUKE'S HOSPITAL, NEW YORK.

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The results, in America, of the administration of ether per rectum in the form of an oil-ether enema, in the hands of experienced anaesthetists have been variable.

The advantages of the oil-ether, outside of its simplicity, in Luke's opinion seem to be more apparent than real. In fact, with the possible exception of selected cases of bronchoscopy, he finds it difficult to see any indication for its use that cannot be as well, and probably more safely, met by the modern pulmonary methods.

Some of the undesirable clinical features which, Luke says, must certainly be looked for in a method involving so many theoretical objections are the following: (1) the rather exhaustive and unpleasant experience# accompanying any special rectal preparation as required here; (2) the occasional necessity and inconvenience of preliminary and subsequent proctoscopic examinations, as a matter of safety and caution; (3) /

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*"Medical Record," New York, Vol,85. No. 19.1914. p. 839 - 841.

(3) occurence during the induction period of cramps, with distressing sensations of fulness and pressure in the lower bowel, accompanied by desire for stool; varying degrees of anal irritation occurring early or late; (4) prolonged induction stage with frequent necessary recourse to the inhalation method; (5) any time after the first fifteen or twenty minutes' respiratory depression may rather suddenly or slowly appear, followed by arrested breathing, loss of muscular tone and dilated pupils, with the possibility of fatal syncope supervening; (6) the occurrence of mild, to very severe, grades of proctitis and colitis, these complications appearing in more aggravated forms where any pre-existent pathological condition is present; (7) delayed recovery, which may be prolonged for many hours; (8) increased toxemia.

INCREASE IN TOXICATION OF ETHER BY NEW METHODS OF ADMINISTRATION.

BY

RAYMOND C. COBURN, M.D.*

ANESTHETIST NEW YORK CITY & NEW YORK POST-GRADUATE MEDICAL SCHOOL HOSPITALS.

In the oil-rectal method of administering ether Coburn says an increase in the amount of ether in circulation results. Here, in the adult, about 6 oz. of ether, plus 2 oz. of olive-oil (both by volume) are introduced into the rectum. All the ether thus introduced reaches the patient's circulation, except that which is subsequently withdrawn, as there is no source of evaporation, such as occurs in other methods. It requires only 1½ oz. of ether in the patient's circulation without rebreathing to induce and maintain an hour's surgical anesthesia. The amount of ether withdrawn in the oil-rectal method shows that a much larger amount than this reaches the patients circulation. The much larger amount of ether required in this method is probably due to the oil interfering with the anesthetic action of ether. Not only is there very much more /

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* Journal American Medical Association Vol. LXII. No. 5. 1914. p. 364.

more than 1½ oz. difference in the original amount of ether introduced into the rectum and that withdrawn at the end of an hour of surgical anesthesia, but there is a decidedly greater tendency toward respiratory paralysis without the corresponding depth of anesthesia that occurs in other methods. This indicates that while the oil may lessen the anesthetic action of ether, it does not correspondingly decrease its toxic action on the respiratory centre. Certain it is that the margin of safety between surgical anesthesia and respiratory paralysis is considerably reduced in the oil-rectal method.

THE TECHNIC OF OIL-ETHER COLONIC ANESTHESIA.

BY

J. T. GWATHMEY, M.D.*
Anesthetist New York Skin & Cancer, Columbus & People's Hospitals, & St. Bartholomew's Clinic.

The author says that the very simplicity of the procedure, if not minutely carried out, may account for the untoward effects that have been noted in some cases.

He repeats the apparatus necessary and method of preparing the patient already mentioned in his other papers, but adds that where narcosis is much delayed a few whiffs of chloroform may be allowed. After a patient has received a mixture, the anesthetist must provide and maintain a clear air passage at all times by manipulating the jaw as in inhalation anesthesia, care being taken to prevent the air supply from being cut off, either by the head falling forward, or sidewise or by the tongue falling back. Patient should never be left alone at any time after the injection.

The question of whether or not a local anesthetic should /

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* "New York Medical Journal." Vol. XCIX. 1914. p.630.

should be used at the site of the operation, as advocated by Dr Crile, is a matter for the surgeon to determine. The author advises its use unless contra-indicated by special conditions.

See also "Oil Ether Anaesthesia" 7. I Gwathmey. Lancet. Vol. II. 1913. p. 1756.

Abstract of a paper read before the New York Society of Anaesthetists. November 20th 1913.

Dr Julian C. Pate* (Valdosta) claims the same advantages for the method as Gwathmey but has only used the method in 3 cases.

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* Medical Association of Georgia. Atlanta. April 15 - 17. 1914.

I have
~~These~~ failed to find any French or German references amongst the literature of the last 3 years.